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ORGANIZATIONAL STRATEGIES FOR PLANNED CHANGE IN EDUCATION.

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FOUR STRATEGIES FOR ACHIEVING LONG-RANGE GOALS IN EDUCATION ARE OUTLINED, AND RELATED CONSTRAINTS, CONTROLS, AND CONFLICTS ARE EVALUATED. STRATEGY 1, A NATIONAL EDUCATION ACADEMY DESIGNED TO PROVIDE TRAINING FOR NEW AND CREATIVE LEADERSHIP, WOULD RECRUIT GIFTED PERSONNEL FOR TRAINING IN A BROAD UNDERSTANDING OF THE MAJOR TRADITIONS OF SOCIETY, WITH INSTRUCTION IN DEFINING MAJOR EDUCATIONAL AND SOCIAL PROBLEMS, FIELD EXPERIENCE, AND A YEAR'S APPRENTICESHIP UPON GRADUATION IN SELECTED EDUCATIONAL ORGANIZATIONS WHICH VALUE INNOVATIVE EFFORT. STRATEGY 2, AN INSTITUTE FOR THE STUDY OF EDUCATIONAL INNOVATION, WOULD FOCUS PRIMARILY ON THE CREATION OF NEW CONCEPTS FOR ADVANCING RESEARCH AND DEVELOPMENT AND WOULD BE PRIVATELY SUPPORTED, STAFFED BY LEADING SCHOLARS ON 1-YEAR FELLOWSHIPS, AND LOCATED NEAR A MAJOR UNIVERSITY. STRATEGY 3, A PLAN TO FACILITATE STATE AND NATIONAL POLICY DEVELOPMENT, WOULD ENCOURAGE INTERORGANIZATIONAL AND REGIONAL EDUCATIONAL ALLIANCES AND WOULD SEEK TO IMPROVE STATE EDUCATIONAL LEGISLATION, ESPECIALLY THAT RELATED TO THE LONG-RANGE FINANCING OF EDUCATION, BY DEVELOPING A PATTERN OF SUPPORT UPON A COMBINATION OF PUBLIC AND PRIVATE FUNDS. STRATEGY 4, THE APPLICATION OF OPERATIONS RESEARCH TO LOCAL SCHOOL DISTRICT PROBLEMS WOULD UTILIZE TEAMS OF MULTIDISCIPLINARY SPECIALISTS TO DEFINE PROBLEMS, DETERMINE THEIR PARTICULAR DIMENSIONS, AND DEVELOP POSSIBLE SOLUTIONS THROUGH THE APPLICATION OF SUCH RESEARCH TECHNIQUES AS MATHEMATICAL MODESL AND PROGRAM EVALUATION. THIS PAPER WAS PREPARED FOR THE CONFERENCE ON STRATEGIES FOR EDUCATIONAL CHANGE (WASHINGTON, D.C., NOVEMBER 8-10, 1965). (JK)

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ORGANIZATIONAL STRATEGIES FOR PLANNED CHANGE IN EDUCATION

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OFFICE OF EDUCATION

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Organizational Strategies for Planned Change in Education

Introduction

Education, our second largest industry today with a current annual expenditure of $42 billion, will likely become our largest industry by the end of the next decade, assuming that relatively peaceful conditions in the world continue. It is a paradox that such a major industry could emerge considering how severely under-developed its systems of research, planning and development are. Its strategies for planned change cannot begin to compare, either quantitatively or qualitatively, with those possessed by our nation's major industry of defense, for example. At the same time, education's truly essential role and its overriding significance for the future of society is unquestioned. This is true whether one views education within the near term perspective of achieving current national goals, including defense, or within the longer-range framework of an ever-renewing and ever-developing society. It would seem, then, that we have been highly inconsistent. while placing high value on education and investing billions of dollars in it, we are not willing or we have not been able to develop effective, long-range planning arrangements.

The current gap between educational investment and educational planning suggests that the important questions during the decade ahead will relate more to the direction and manner of educational change than to its rate and scope. Will colleges of education, for example, move in the direction of extinction or of distinction? To what extent will state education departments consciously develop new approaches to change and to what extent will they be destructively buffeted by unperceived forces and uncontrolled actions? Will change take our ponderous urban school districts toward further deterioration or will these districts achieve new thrusts through new forms of organization? The answers to such questions as these depend upon the answer to a still more general question underlying our

deliberations: namely, to what extent can planned change in fact be achieved in education?

As we address ourselves to the topic of planned change, the usual problems of definition arise. The concepts associated with the topic are so many and so complex that the entire paper could be definitional in nature. However, since this clearly is not my assignment, definitions will be limited to a few basic concepts.

We shall use Matthew Miles' definition of change as an alteration in "the goals, structure or processes" of an educational or education-related system between time I and time II.[1] Planned change implies the explicit design and control of the activities which are to bring about the desired alteration between time I and time II. Thus, planning for change is not necessarily planned change because control of designed activities may not be accomplished. Control, when achieved, involves the effective performance, as Egon Guba has already implied, of such roles as research, development, diffusion, and the adoption and institutionalization of innovations.[2] Although a high degree of rationality is associated with these knowledge-related roles, substantial conflict may also be involved in any and all of them. Therefore, an essential part of planned change involves the use and management of conflict.

An organizational strategy is a sequence of activities designed to achieve a defined goal or goals within a recognized structure. The strategies set forth in this paper are oriented more to long-range than short-range objectives and are more indirectly than directly related to learning processes.

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[1]Matthew Miles, "Educational Innovation: The Nature of the Problem," in Innovation in Education. Matthew Miles (ed.), New York: Bureau of Publications, Teachers College, Columbia University, 1964, p. 13.

[2]See David Clark and Egon Guba, "An examination of Potential Change Roles in Education," National Education Association, Center for the Study of Instruction, Airlie House, Virginia, October, 1965.

The design of strategies, which is essentially a developmental activity, involves the use of existing concepts to define a set of activities related to an explicit goal or goals, on the one hand, and the projection of ways to cope with predicted conflict which will arise when the set of actions is implemented, on the other. Thus, if a training innovation were involved, design would encompass (1) the specification of the training activities and (2) the definition of actions for coping with the conflict which would likely arise during the period when dissemination about the innovation began and the time when it is finally institutionalized. The task of projecting organizational strategies can be approached at the level of elaborating concepts which would shape design or at the level of providing detailed designs of specific strategies. I shall interpret my own task as more that of elaborating concepts rather than providing detailed designs.

So much for definition. Let us now return to education's investment-planning gap noted above. Why is educational planning so underdeveloped at the same time that education is so highly valued? What are the significant constraints which bind our efforts to achieve planned change? If we could obtain insight into the constraints that limit us, a fruitful beginning would be established. A clear understanding of important constraints, in other words, could help us generate new organizational strategies as well as help provide a basis for assessing strategies already being used.[3]

Clearly, there are various classes of constraints which affect educational change. For example, there are those related (1) to our limited knowledge of change;[4]

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[3]For a special treatment of the concepts of "constraints" see Herbert Simon, "On the Concept of Organizational Goal," Administrative Science Quarterly, Vol. 1, June, 1964, pp. 1-22.

[4]The significance of the knowledge constraint within the context of organizational strategies is vividly illustrated in a recent article by Richard Walton entitled "Two Strategies of Social Change and Their Dilemmas." (See Journal of Applied Behavior, Vol. 1, No. 2, 1965, pp 167-179). Professor Walton, in dealing with the question of what the leader does to achieve desired change in the face of major conflict, documents the fact that two groups of social scientists would offer leaders quite different advice. One group would recommend the building of a power base; the strategic manipulation of power; the biasing of the rival power groups perceptions about the strengths of the opposing group's preferences and values; threat; and so forth.

The other group would offer a strategy involving the use of trust rather than power; the reduction of threat rather than the systematic use of threat; honest communication rather than dissimulation. Such striking differences in strategy, which are based at least in part upon social science concepts, highlight knowledge constraints in planned change.

(2) to personnel and other resources necessary for change; and (3) to cultural factors as, for example, traditional views of the role of local, state and federal government in facilitating planned change. In projecting strategies, I shall in each case identify a selected set of constraints affecting planned change, will then analyze the constraints and, finally, will set forth the outlines of a strategy for coping with the constraints. The four strategies described are illustrative. They are oriented to the interests and problems of the differing personnel attending this conference. Strategy IV is designed to relate more to the interests of local school leaders; Strategy III more to state department and U. S. Office personnel; Strategy II more to university personnel; and Strategy I to all educational leaders in general.

Strategy I: A National Education Academy.

The first set of constraints to be examined are those related to personnel who are to carry out planned change. In this regard we might remind ourselves of an observation made a few years ago by John Gardner: "Nothing is more vital to the renewal of an organization (or society) than the system by which able people are nurtured and moved into positions where they can make their contributions."[5]

What can be said about the constraints that affect the selection, nurture and performance of "able people" within the context of planned educational change? First, we might note that even though there are major differences in the processes and outcomes of research, of development, and of the adoption of innovations in education, the successful performance of all these functions involve talents of a very high order. E. L. Thorndike who formulated previously unasked research questions, Jerrold Zacharias who played a central role in the design of a new physics curriculum for high school students, and Horace Mann who achieved a new order of consensus concerning public education, all exhibited unusual behaviors. In fact, one can ask whether or not there are any societal functions demanding more creative talent

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[5]John Gardner, Self-Renewal: The Individual and the Innovative Society (New York: Harper and Row, 1963), p. 76.

than must be displayed by those who would attain fruitful research, ingenious development and significant institutionalized innovation in education. We come, then, to our first constraint, namely, that in any time period for any field of endeavor, the number of persons capable of achieving research, development and/or institutionalization breakthroughs of sufficient import to set new directions in education is limited.[6]

The fact that many of the innovations, which have helped set new directions in public education since the beginning of the Sputnik period, have been initiated largely by persons outside or marginal to the field of public education rather than by professional educators, would suggest that the constraint within the ranks of those with professional training and public school experience may be even more substantial today than during earlier periods. In any event, it seems clear that a new leadership structure in education has emerged at the national level which, at the core, is composed of non-professionally prepared personnel who have had limited public school experience. James Cass has commented on this development in connection with the recent White House Conference as follows:[7] "For the program and the list of participants placed on the record, where all could see, the fact that the Old Educational Establishment is no longer providing the leadership for the nation's educational enterprise."

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[6]It is not meant to imply that creativity in education is limited to a distinguished few. A recent statement concerning the definition of creativity is relevant: "The study of creativity need not limit itself to the eminent, the extraordinary. There are kinships between the small and the great and perhaps even between the creativity of everyday life and that of a great scientist or artist. If we include "everyday creativity" in our study, we may be in danger of making our conception of it meaningless; but if we exclude it, perhaps we trap ourselves in a "great-man theory" that leaves us no way of moving between the commonplace and the sublime." See Howard E. Gruber, Glen Terrel and Michael Wertheimer (eds.), Contemporary Approaches to Creative Thinking (New York: Atherton Press, 1964), p. x.

[7]James Cass, "White House Conference: Harbinger of Change," Saturday Review, August 21, 1965, p. 45.

Leading members of the Old Establishment are long-time public school professionals who, in Cass's words, "bear proudly their scars of the 1950's." Leading members of the new Establishment, on the other hand, emerged during and since the 1950's, according to Cass, and they are noted for their pragmatic orientation and for their interest in educational change.

Whatever theory one uses to explain the emergence of the new leadership, it does seem clear that our educational bureaucracies have had great difficulty, during the last decade especially, in adapting to the changing needs of society. Our giant city school districts, our growing state education departments, our huge professional organizations, our large schools of education in complex multi-universities--with all their past accomplishments--have been slow to respond to the needs of a society in ferment. More specifically, a good case can be made that they have been remiss in meeting the personnel challenge and in achieving needed organizational renewal.

The observation can be illustrated from the perspective of universities and the lag in programs to prepare personnel to engage in planned change. Under current arrangements, students are being prepared to undertake such functions as research, development and the institutionalization of innovation--functions which involve dissimilar kinds of creative activities in different settings--while being recruited from the same talent pools and being offered much the same kinds of educational programs. This is true even though we have much more explicit definitions of the various functions associated with planned educational change and a better understanding of the differences in these functions, than was the case ten years ago. The lag between concepts which would guide the development of new programs to prepare personnel to specialize in various change functions and the concepts which underlie existing

programs is, in other words, wide.

While universities have failed to create needed preparatory programs, school districts, state education departments and other organizations, have been remiss in creating climates and in allocating resources which would support innovative effort. Deeply immersed in carrying out large and immediate tasks--often with limited personnel and material resources--these organizations, by and large, have not had planning departments whereby the old could be continuously challenged by the new and where constructive long-range alternatives for planned change could be generated and assessed. Under these conditions, it is understandable that many leaders in educational organizations necessarily have assumed the posture of opposing rather than of proposing educational change.

The price for neglecting the challenges of attracting society's most outstanding talent into education and of providing the settings where creative talent could flourish has already been substantial, and payment is not nearly complete. With education expanding at all levels and with the increasing emphasis being placed upon educational innovation, the impending personnel crisis in education is likely to be of major proportions. Even though we have a new and powerful leadership which can set directions and can provide support for programs to achieve change, the gap between the setting of new policy directions, on the one hand, and the implementation of policy, on the other, always marked in any organization, is now a yawning one in education.

Fortunately, the recently passed Elementary and Secondary Education Act provides special opportunities for those interested in coping with personnel constraints within the context of planned change. The Act offers universities, for example, a

special stimulus to design new programs to recruit and prepare personnel to engage in planned change functions. It offers all educational organizations an invitation to innovative effort. As significant as the new Elementary and Secondary Act's organizational strategies are for coping with personnel constraints in education, they are still insufficient, in my judgment, to meet the long-range challenges before us. We need additional strategies. Therefore, I offer for consideration the concept of a new National Education Academy.

The major objective of the projected National Education Academy would be to attract society's most promising and most imaginative persons into education and to prepare them in such a way that they would make major contributions to planned change. The Academy would place priority on recruiting and preparing talented developers--personnel highly gifted in designing solutions to educational problems. It is recognized, of course, that some of the Academy's graduates might eventually become researchers and that others might advance change by assuming roles in education where they would be centrally concerned with adoption and institutionalization of innovations.

Graduates of the Academy, after apprenticeship experiences, should become accomplished articulators of ideas related to significant problems of educational policy. They would have the capabilities to serve eventually at the highest level of educational organization in school districts, state education departments, the Department of Health, Education, and Welfare and related organizations. In such positions, they would wield a substantial influence on education.

Clearly, the impact of the Academy would not be limited to a given level of government or level of education. Nor would its contributions be limited to a given

section of the country. Rather the strategy projected is one which is national in character. Since it would clearly serve the national interest, the Academy should be federally supported. Support would include not only operational funds but also comprehensive financial aid for students achieving the high honor of being admitted to the Academy. The Academy might be governed by a board appointed by the United States Commissioner of Education.

Having provided a brief description of the idea, let us now turn to more specific concepts related to strategy. As already intimated, such concepts would be of two general types: those related to the Academy's recruitment activities, its staffing procedures and its curriculum plans; and those involving projected problems of conflict management as these would be encountered during the founding of the Academy. Concepts of both types will now be elaborated.

First, the Academy would recruit and admit the most highly talented person's populating the nation's secondary schools. Inventive individuals who had a deep interest in helping solve important social and educational problems would be sought. Such a strategy is based largely upon the proven concept that innovation is most frequently advanced by those holding fresh and more youthful views of problems; further, it recognizes that our current recruitment procedures are not adequate to meet the competition for talented high school students.

Second, the curriculum of the Academy, which might be a five-year one, would give students an understanding of the major traditions of society, its major trends and its emergent problems. Much emphasis would be placed upon providing students opportunities to see and examine the relationships between society's major governmental, educational, and industrial institutions and its emergent social and

educational needs. During the first four years, in particular, content from the humanities and the social, natural and physical sciences would be central to the curriculum. The fifth year would encompass content more directly related to education. The concept underlying the curriculum strategy is that developers, even more than researchers, need a broad educational base.

Third, instruction would be designed to help students comprehend and define some of society's major educational and social problems. Special efforts would be made to develop understandings of the interrelationship between and among society's problems. Thus, problems of Negro education, for example, would not be viewed from the perspective of the schools alone but also in relation to such matters as housing, civil rights, poverty and employment opportunities. Such an approach, in other words, would entail an examination of social and educational problems from within the broader context of educational, governmental, social and industrial institutions. The concepts underlying this aspect of strategy is that development of solutions must follow an understanding of problems; further, that educational problems are intimately related to other societal problems.

Fourth, before graduation, students would be provided opportunities to come to grips with real problems in such agencies as large city districts, state education departments, the U. S. Office of Education and related organizations. During the fourth and fifth year, for example, students might plan to spend one or more quarters in the "field." Field activities might involve studying and diagnosing educational problems, examining adoption or institutionalization processes and their implications for development, or testing the relevance of research concepts to applied problems. The emphasis on field experience is based, in part, upon widely

accepted concepts of learning and motivation.

Finally, upon graduation, students would spend a year's apprenticeship experience in carefully selected educational organizations which valued innovative effort and which would establish conditions to facilitate innovative thought. This experience would involve efforts to actually design solutions to educational problems. The underlying concept for the apprenticeship idea is one central to all professional training and again highlights the role of experience and practice in learning.

So much for concepts which would have strategic significance for defining the activities of the Academy. Planned change, as already noted, also involves the use and management of conflict. What would be the strategic sources of conflict which would face those desiring to institutionalize the National Education Academy?

First, there would be conflict between those willing to undergo the risk of establishing the Academy and those with more cautious attitudes. The more cautious would fear failure, would likely worry about whether or not students could be attracted to the Academy, whether the projected education would actually prepare them for development careers, whether established organizations would accept and help graduates make the transition, whether "drop-outs" would not be extremely great and so forth. Risk-takers, on the other hand, would be more willing to face uncertain outcomes. They would likely recognize more quickly that all existing institutions preparing professionals have substantial drop-out rates and that the efficacy of traditional modes of preparation is not yet absolutely proven. In addition, they would feel a greater urgency to solve current personnel constraints and would likely place higher value upon experimentation and upon educational innovation.

Second, there would be conflict arising from those who are concerned about what is sometimes labeled the "federalization of education" and those who would see the establishment of the Academy as a legitimate way to serve the national interest. This conflict might be enhanced by the current concern about the increasing role of the federal government in education.

Third, there would likely be some conflict between the proponents of the Academy and those in universities already engaged in preparing personnel to perform planned change functions. This conflict is explained by certain social scientists through the concept of "vested interests." Proponents of the Academy might argue that current institutions are so caught up in tradition that they cannot meet the total training challenge vis-a-vis planned change in education. They might also believe that the Academy would complement rather than compete with current efforts in that its graduates would constitute a very small proportion of total number of education's personnel. Some university personnel, on the other hand, might feel that they were much more experienced and capable in preparing personnel and that existing institutions should take on the task.

In summary, then, we are fortunate to have a new leadership establishment which reaches all the way to the President of the United States; however, this alone does not guarantee successful planned change in education. The implementation of such change will necessarily depend, in the final analysis, upon the abilities and motivations of a large cadre of talented personnel. Therefore, special efforts must be made to achieve a greater supply of highly gifted personnel to meet the challenges of planned change. Because existing training institutions are already heavily burdened and because their many traditions often make it difficult to adapt to emergent

challenges, a new organizational strategy in the form of a National Education Academy is proposed to meet some of the challenges before us. Concepts related to the specific design of the projected Academy's recruitment, curriculum and instructional procedures have been outlined and major sources of conflict likely to be encountered during the period when the new organization is institutionalized have been identified.

Strategy II: An Institute for the Study of Educational Innovation.

The high degree of creativity required to set and implement new policy directions in education and the inadequate numbers of creative personnel available to engage in these functions constitute only a part of the personnel constraint problem. Achieving organizational climates where creative personnel can bring about successful research and developmental outcomes is another important agenda item; unfortunately, the process may be hindered by the emergency mood in education which, in one sense, is symbolized by the variety and scope of recent federal legislation. Those responsible for managing massive, new, and federally-supported research and/or development projects--projects which are designed to solve difficult residual problems in education--inevitably develop a strong sense of urgency in the conduct of these programs. This urgency may be heightened by strong external expectations which emanate from those responsible for passing new legislation, those charged with its successful administration and those on the "firing line" in education who need immediate help with burdensome problems. There is evidence that the demands for quick, practical and measurable results, which are frequently associated with American endeavors, is increasing in education.

While such expectations increase the pressure for immediately helpful results,

personnel involved in the difficult tasks of research, development and the institutionalization of innovations inevitably must experience considerable failure or, at a minimum, be delayed in their efforts to achieve significant success. More fundamentally, an examination of the processes and outcomes of research and development in various non-education fields would suggest that a certain amount of high-risk taking, of sanctioned freedom to fail and of delayed gratification are extremely important in achieving innovation. A recent newspaper report concerning the development of an influenza pill illustrates the point: "It (symmetrel) is one of the results of 12 years in time and almost 100 man-years in effort by professional personnel in the company's research program into the control of virus diseases through chemistry. It was started at a time when many scientists felt this would be impossible." (Columbus Citizen Journal, September 28, 1965.)

In the face of growing external demands for demonstrated and practicable results, the stage would seem to be set, then, for enhanced conflict between and among the managers of large research and/or development projects, those desiring immediately useful results and those within projects carrying out research and/or development functions. The manner in which this conflict is resolved will have long-range implications for those interested in planned change in education. At worst, the conflicts and pressures facing those carrying out research and/or development functions could be such that these personnel will become so fixed upon habitual ways of thinking and perceiving and so ready to settle for the first solution proposed that they become incapable of putting aside inadequate concepts of problems and of achieving needed new cognitive or institutional structures in education. Put differently, the concerns engendered by demands on those carrying out new programs

could be such that they blot out the detached and independent view so necessary for facilitating long-range planned change and become inimical to conditions of freedom, so necessary for creativity. At best the conflict might result in a much better understanding of our long-range planning needs and of their relationships to short-term needs. This in turn could lead to the development of mutually supportive dual strategies specifically designed to serve both short-term and long-term purposes.

One of the biggest problems facing the new leadership and others concerned with planned change may be the tendency to become so deeply involved in trying to demonstrate immediate and practicable results that the long-range challenges pertinent to innovation are neglected. Indeed, this problem undoubtedly is intimately related to the investment-planning gap already noted. Needed balance between the short-term and the long-term interests will not be easy to achieve and the pattern established in regard to this challenge at the national level will likely pervade other parts of our educational system.

Clearly, there are many potential strategies for dealing with the mood of emergency in education. One approach is to create organizations in which the conditions are such that gifted personnel will be insulated from the demands to produce immediately. Such organizations could complement other agencies which are pursuing near-term goals. It is within such a framework that we propose the concept of an Institute for the Study of Educational Innovation.

A major goal of the Institute would be to create new concepts necessary for advancing research and development within a framework of planned educational change. The Institute would seek to attract scholars who are interested in attacking

problems whose solutions would have long-range implications for planned change. The emphasis would be on creating concepts relevant to the substantive, methodological or organizational dimensions of planned change.

Since the Institute would also seek to encourage and to make it possible for the nation's leading scholars to engage in concept development related to planned change, it would deal secondarily with the important set of personnel constraints discussed in the introduction to previous strategy. It would, in other words, be designed to increase the number of creative persons who could make contributions to planned change.

Since it is essential for those in the Institute to be freed entirely from the press of the immediate in order to concentrate on problems from within a long-range framework, private support for the enterprise would be highly desirable. Such support might be sought initially for a period of ten years, since such a time period would be more compatible with the character of the organization than would a shorter period.

Having described the nature of the Institute in general terms, let us now turn to more specific concepts which might shape the design of its procedures for selecting scholars and the activities which it would seek to stimulate.

First, the process of choosing Institute participants would be a highly selective one. The goal might be, for example, annually to select 30 leading scholars for one year fellowships. These scholars might come from any department of a university in which qualified personnel wished to develop ideas pertinent to planned change. Emphasis would be placed on recruiting persons of brilliance, who likely would not be willing to join the usual research or development project, but would

be interested in the freedom to study and to pursue ideas in a stimulating environment for a one-year period. The concept underlying the selection process is that innovations are usually advanced by highly talented individuals who value a stimulating environment and the freedom to think about problems of great personnel interest to them.

Second, an effort would be made to select participants who had richly varied backgrounds. As already indicated, personnel with differing disciplinary backgrounds would be sought. In addition, the Institute might aspire to achieve some balance in numbers between established scholars and those more youthful ones who show unusual promise. Finally, each year a few scholars might be selected from nation's outside the United States. The concept underlying this aspect of the Institute's strategy is that differing perspectives insure conflicting views, stimulation of thought, examination of concepts and, hopefully, recombinations of ideas which are basic to innovation.

Third, the Institute should be located in or near a major university so that its participants could draw upon substantial library and related resources. It should also be conveniently placed in relation to other important educational organizations such as city school districts or state education departments. Such placement would enable students of innovation to develop ideas or to test them easily in relation to real settings, if they so desired.

Fourth, Institute activities would be generated informally, for the most part. Much emphasis would be placed upon independent study and the free pursuit of interests. However, special interest groups might be developed and, on occasion, special lecturers or consultants might serve the interests of all or a substantial

number of the Institute's participants.

Predicted conflict during the gaining of support and in the implementation of the Institution would likely be minimum. Those interested in the immediately practical might question the value of the organization and some might even question the wisdom of taking the needed risks implied in the Institute concept. However, many others would look beyond the mood and needs of the moment and would make a strong case for supporting the Institute idea and for designing and implementing specific strategies necessary for its fruition.

Strategy 3: A Plan to Facilitate State and National Policy Development

The current impingement on education of deeply embedded and sharply conflicting values concerning the desirable roles of local, state and federal government is obvious. At a time when federal agencies are assuming greater power over education, today's citizens still hold many of the negative sentiments toward authority which prompted their ancestors to throw tea into the Boston Harbor. We have, in other words, at the center of federally facilitated educational change today such deeply pervasive and sharply conflicting cultural values as freedom and control, initiative and compliance, centralized direction and local autonomy, organized effort and individual creativity. To illustrate the point, when a leading school superintendent was recently confronted with certain governmental demands, he responded by labeling the federal action "despotic, alarming and threatening" and by proclaiming that such action "undermines the local control of education." In his brief speech, which made national television, he went on to state: "While I am sorry this happened to Chicago, perhaps it is a blessing in disguise. It may

serve to alert the public to the capricious and autocratic actions emanating from the federal education offices." (Chicago Tribune, October 3.) As conflict such as that just noted arises and is expressed, a powerful brake is applied to change and, while some adjustments necessarily occur, culture tends to protect itself against radical departures from the status quo.

In considering the strategic implications of changing local, state and federal relationships and power alignments for planned change, we should first ask what the existing organizational arrangements are which enable society and its leaders to manage emerging conflicts within the governmental context. It seems clear that new accommodations are being developed and used to help resolve conflicts between proponents of local autonomy and those interested in national concepts of educational development. New organizational arrangements, for example, which are neither local, state nor federal but rather rest in between and are linked to these various levels of government[9] are being increasingly used to facilitate planned change. Often regional in character, these new patterns play a major role in the constructive mediation of conflict.

Growing initially from combinations of sub-federal units, the following are illustrations of the new patterns: the dozens of inter-university organizations in higher education which are pursuing a variety of purposes through joint effort;[10] organizations of local school districts such as are represented in the school study

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[9]See Burton Clark, "Interorganizational Patterns in Education," Administrative Science Quarterly, September, 1965, Vol. X, No. 2, pp. 224-237.

[10]John Wittich (ed.), College and University Inter-institutional Cooperation, Proceedings of the Conference on College and University Inter-institutional Cooperation. Princeton, New Jersey, 1962.

council movement or in regional approaches to providing special education and other related services; and state compacts such as the Southern Regional Educational Board.

Patterns such as those just noted, are made up of local, state and higher education units. Foundations, which have helped stimulate a concern for the national interest in education, have been instrumental in helping create these new regional alliances by aiding those in local, state and higher education units in their efforts to link themselves into larger organizations. The initial efforts of most inter-university organizations have been supported by foundations, for example; the same would be true of state compacts as illustrated in the recent support for James Conant's idea of an Inter-State Compact.

Although federal support is channeled through a variety of sources, regional compacts are receiving an increasing amount of this type of aid. The concept underlying the new regional laboratories, which, in a sense, epitomizes the trend toward special educational alliances by amalgamating into one compact a variety of regional organizations, represents a further development of the idea.

There are of course interorganizational patterns to facilitate planned change which are more national than regional in scope. These have been encouraged largely by federal programs affecting education. For example, Burton Clark describes, as follows, the national network of organizations involved in the work of the Physical Science Study Committee in its efforts to effect planned changes in high schools:[11]

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[11]Burton Clark, Ibid., p. 231.

> "A Federal agency (The National Science Foundation) provided the funds; a private non-profit group received the money and developed a new course; commercial organizations made the materials available to all units of the decentralized educational system; dispersed universities and colleges used the new materials to train teachers in all regions of the country; existing local authorities adopted the materials and allowed their teachers to reshape the local courses."

The linkage pattern in this particular case of planned change clearly was a complex but effective one. Similar but more limited linkage patterns can be seen in other aspects of the curriculum reform movement, in the Cooperative Research Program, the National Defense Education Act and other federal programs.

Whether interorganizational arrangements start from local, state and higher education units or from federal programs, they help bring about change within a framework of shared decision-making where authority and influence are dispersed. These arrangements respect the need for decentralized decision making and, at the same time, represent an important influence on this decision making.[12] They generate conflict and also help to resolve it. By capitalizing on important motivational factors such as prestige, by involving talented individuals and strong institutions, by using the concept of the external change agent, by generating and resolving conflict, and by employing an extended dissemination network, these organizations have played and are playing important roles in education.

By encouraging the establishment and use of regional alliances and nationally oriented forms of interorganizations, national legislation is shaking the traditions of state, local and higher education units and, at the same time, is avoiding marked federal control. Instead of seeking an overt and powerful federalism with

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[12]Burton Clark, Ibid., p. 229.

obvious control over local educational units, the strategy, would seem to be that of boldly developing confederations which, in fact, will substantially influence local decision making. Although such elements of the confederations as inter-university organizations were evident as long as four decades ago, current and emerging forms represent new and, what may come to be viewed as, historic changes in organizational strategies to improve education.

These new developments, in one sense, highlight the important reserves of a democracy. At a time when local, state and higher education units were suffering from a certain complacency and having great difficulty in responding adequately to significant new needs in education, the federal government became both a powerful external stimulant and a potential helper. Unquestionably, education will be permanently affected, as was the case more than a hundred years ago when state educational units seized the leadership role in American education.

Even though the strategies underlying current programs may come to be viewed as historic, they have some basic limitations. In the first place, the confederations being used and developed are made up largely of highly selected individuals and institutions. Borrowing from the strategy developed and used by foundations of involving the strong universities, the most capable and visible individuals, and the school districts where there are personnel capable of developing, communicating and dramatizing ideas, those advancing regional alliances have achieved a selective mix. Apparently the strategy has been very successful, especially from the standpoint of advancing educational excellence, a highly legitimate national concern of the last ten years. However, since the strategy has often tended to

ignore or to by-pass our weakest local, state and higher education units, it has limitations from the standpoint of equalizing educational opportunity. Since the national interests include both our stronger and not so strong institutions, the strategy is, therefore, neither all-encompassing nor, in its present form, will it be permanently sufficient. Its insufficiency is suggested by the consideration that we have had a continuing tension between excellence and opportunity in education and historically, we have tended to emphasize one and then the other.

Perhaps some shift is already evident in more recent legislation dealing with opportunity for the disadvantaged and the poverty stricken. Clearly, the concern of this legislation is substantially different from that inherent in the NDEA and National Science Foundation programs, as are its strategies of implementation. Thus, the question still remains concerning a more encompassing or supplementary strategy for dealing with those higher education units, local districts and states which are less affluent and which historically have had limited support abilities and inferior opportunities for education. Will the federal government devise new and more encompassing strategies than it has currently? Will the problem of strategy fall to the individual states? Will the problem be a new frontier for our large private foundations? Will there be, as is so frequently the case, a combined approach to encompassing strategy?

A second limitation of educational alliances stems from the fact that many of them are not systematically linked to individual states. Since states in our system are the major legal units responsible for education, this limitation poses problems of coordination. Effective coordination is dependent upon clear conceptions of what state, regional and national legitimate interests in education are

and how these are interrelated. Important issues pertinent to the long-range financing of education impinge directly upon these various interests. Since states play such important roles in financing education, there are significant questions at this stage in history concerning the role of individual states in long-range planning, policy making and coordinative effort in education.

With the burgeoning federal activity in education, any strategy for advancing state planning and coordination should desirably be based upon a definition of the national interest in education. Even though federal participation in education can be justified only on the basis of some defined national interests, these interests so far have remained implicit and must be inferred from specific legislative acts. Apparently no strategy is emerging for a comprehensive definition of long-range national interests in education. Mitigating against the development of such a strategy is the view of many federal executives and legislators that premature public discussions of policy alternatives and of legislative programs, which are in the national interest, are likely to interfere with the timing and passage of such programs. Thus, we come to another major constraint: existing legislative and political processes often hinder long-range policy development in education.

In facing the question of long-range state and federal planning in education, it might be well to remember that the charge originally given to the U. S. Office of Education was the collection and diffusion of information. Traditionally, information has been interpreted to mean statistics and data obtained from surveys. More recently through "Operations Fingertip," there has been a move toward providing information on emerging educational innovations of a different nature.

This new type of information will likely be another important aid to those interested in planned change.

Since the most significant information about education relates to decisions of planning and policy, would it not be desirable for the U. S. Office of Education to confront more directly the problem of educational policy and the provision of information pertinent to such policy? Though the U. S. Office of Education provides some relevant quantitative data, James Conant and others have talked about the inadequacy of our facts as they relate to educational planning and policy. A major need is for qualitative information and for clearly elaborated policy alternatives, which can be weighed and examined. If long-range planning is tobe advanced, the development of ways to encourage the explication and discussions of long-range alternatives in education will be essential.

There is another more subtle reason for being concerned about the generation of policy alternatives and the development of information concerning them. This stems from the great tradition of compromise and accommodation which is central to our tradition. Charles Frankel in his book The Democratic Prospect commented more generally a few years ago on the importance of ideas and the generation of policy alternatives in a democracy. The following statement seems very timely as we view the educational scene today:[13]

> "And the one unmistakable goal of all democratic governments, when they arrange their bargains and compromises, is to win the next election...

[13]Charles Frankel, The Democratic Prospect, New York: Harper and Rowe, 1962. pp. 47-48.

> This is the context in which every discussion of planning and of the development of consistent policy in a democracy must be placed...
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> But it is for this reason too that democratic politics require ideas. Unless men have some coherent conceptions of their existing condition, unless they can imagine the long direction in which they would like to move, the politics of the bargain, the politics of equilibrium, can be a deadly affair - unfocused, uninspired, and, for all its realism, unrealistic. It can settle down, not simply very close to the center, but to a dead center, quarreling over issues that are ghosts of the past and tinkering with problems that lie at the fringes of the questions that have to be faced. With reservations, that is the picture of the American politics at present..."

Thus, the question remains: Can we develop a longer-range vision of education's directions in the face of powerful tradition and constraints? Can we explicate and assess policy alternatives which are clearly related both to the national interests in education and which are coordinated with state and local interests? Those giving national leadership in education, in my judgment, could err just as greatly on the side of doing too little with regard to this problem as on the side of doing too much.

So much for an analysis of the problem with its various facets having to do with conflicting cultural values, with limitations in interorganizational patterns, with a lack of information and ideas about policy, and with political constraints which mitigate against long-range planning. Let us now outline a strategy which hopefully will stimulate further work on the problem of long-range planning and policy within the context of state and federal government.

The strategy to be projected deals with the generation and assessment of policy alternatives within a five-year framework and with particular reference to

the financing of education. Special attention would be given to national and state policies and to the achievement of more clearly defined relationships between them. Therefore, the strategy involves the creation of special state organizations, the development of an organizational strategy which is more national in character, and the careful linking of both arrangements. More specific concepts underlying the strategy will now be presented.

First, the major target of the strategy would be changed and improved legislation to support education in the various states. Intermediate to this achievement would be widespread and informed discussion of policy alternatives for education. Discussion would be based upon information and ideas within a framework which includes both higher education and public education. The concept underlying this aspect of the strategy is that all states have a basic responsibility for financing education; further, that in this period of great ferment, state support programs need to be updated and to be seen in relation to national interests and trends.

Second, the strategy would include plans for informing the political process through systematic scholarship and the creation of alternative educational policies. To achieve a better basis for developing alternatives, studies both at the national and at the state level would be undertaken. Since education is being increasingly viewed in relation to the concept of investment and since economists have developed methods for projecting policy alternatives, they might play a leading role in the studies. For example, the national study, which might be housed at a location such as the Brookings Institution, desirably would be headed by a Walter Heller, Theodore Schultz, Werner Hirsch or comparable economist.

Werner Hirsch, who has done a number of studies on the economics of education, recently noted the types of questions pertinent to education to which economists can address themselves: "What kind of education should be offered?

For how many students? By how many teachers and supporting personnel, with what background and training? Using what facilities? At what locations? At what cost? How is the necessary money to be raised?[14] Questions such as those noted by Hirsch would provide a focus for the national study.

While such questions might be attacked principally by economists, scholars from education would provide assistance. In addressing themselves to the above questions, economists would use such tools as program budgeting and benefit-cost analysis to generate policy alternatives and to provide some evaluation of the alternatives.

While the questions would be approached from within a national framework, the study would set forth implications for state policy concerning the financing of education. By viewing education at least in part as investment, the scholars might draw upon the findings of more general investigations such as the Interagency Project on Economic Growth and Employment Opportunities--a Department of Labor endeavor which will include a number of projections concerning the national economy.

Concomitant with the national study would be investigations in each of the individual states aimed at the development and assessment of long-range policy alternatives vis-a-vis the financing of education. Luckily, much data relevant to state problems are now emerging in the very timely Project 70, the results of which are now being made available by the Council of State Governments. Project 70 has organized and is organizing data for the period 1964-70 on state-local

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[14]Werner Hirsch, "New Developments in Economics of Education," A paper presented at a UCEA Career Seminar at the State University of New York at Buffalo, October, 1965. (Mimeographed) p. 1.

financing. The general purpose of the study "is to broaden factual information on the fiscal capacity of the 50 states." The study assumes that the "financial charting of state and local revenues and expenditures for a period of five or six years ahead facilitates an understanding of developing problems in state-local finances and helps to define the possible courses of government action."[15]

Public spending in Project 70 is viewed in relation to a number of state functions such as transportation, higher education, and public welfare. Significantly, the project is making and will make use of national statistics on education and of certain projections concerning the national economy and its growth patterns. Therefore, it contains much useful information concerning the relationship of fiscal policies at various levels of government.

Project 70 provides information pertinent to a number of questions related to the long-range financing of education. Illustrative questions for which there is pertinent information for the 1965-70 period are the following: What state functions are likely to compete most sharply with education for revenue? To what extent will public school enrollment increase nationally and how will migration affect increases? What will be happening to non-farm salaries generally and, if the salaries of instructional and non-instructional personnel are projected on the same basis, what will be the annual estimated expenditures for school salaries in 1970? What is happening in regard to program extension (e.g., pre-school work, lengthened days, lengthened school years, and so forth) and what are the implications for increased expenditures? What are the projected expenditures for higher educa-

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[15]Selma Mushkin and Eugene McLoone, Public Spending for Higher Education, 1970, Chicago, The Council of State Governments, 1965.

tion and what implications will the unusual costs in this sector have for public school support? What are the major alternatives for adjusting sources of revenue to meet emerging educational demands?

Additional data undoubtedly would need to be gathered in each state beyond that which will be available in Project 70 and alternative legislative recommendations would have to be developed. Studies at the state level might be housed in the governor's office in each case and might be directed by scholars on leave from universities or by others equipped for the task.

Third, another aspect of the strategy would be an arrangement which would formally link scholars with those concerned with political processes and the passage of legislation. Therefore, advisory groups would be associated with those conducting studies at both the state and national levels. In this regard, the concepts developed by Stephen Bailey and his colleagues in a study of legislative processes in eight Northeastern states are relevant.[16] Among other things, the study disclosed that effective legislative effort at the state level generally involved four major groups: scholars; state government officials and those in state education agencies; education associations and their satellites; and special coalitions of state organizations with interests in education.

Thus, advisory committees at the state level might be composed of university scholars specializing in economics and/or school finance; state legislators and executives, including those in state education agencies; members of organizations representing teachers, school board members, and superintendents; and

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[16]Stephen K. Bailey, et. al., Schoolmen in Politics, Vol. 1, Syracuse: Syracuse University Press, 1962, pp. 22-39.

members of other relevant organizations and outstanding citizens not representing a particular constituency.

The group advising those conducting the study at the national level might include persons such as the following: scholars in such organizations as the Brookings Institution, the National Planning Association and universities; government officials from Congress, the federal executive branch, and the Council of State Governments; professionals from such organizations as the Council of Chief State School Officers, the National Education Association, the American Association of School Administrators, the National School Boards Association, and the Association of Land Grant Colleges; and representatives of special organizations such as the U. S. Chamber of Commerce, and the National Congress of Parents and Teachers as well as leading citizens interested in education.

Advisory members would have two major responsibilities: (1) to react critically to the results of the studies as they emerge and (2) to provide leadership in seeing that the results have an impact on legislation. Those conducting the studies would take final responsibility for written statements on policy alternatives.

Fourth, the most desirable pattern of support for the study might be a combination of public and private funds. Thus, federal and state funds might be made available for the state studies and private support might be sought for the national study. Clearly, support would be essential for the successful conduct of both sets of studies.

Having projected some concepts basic to the design of the strategy, let us now turn to conflicts which would be encountered in its implementation. One of these conflicts would arise because of differing views about the political process.

Some would argue that legislative results stem from such elements as the use of political power, the holding of informal, non-public discussions and the achievement of compromise among differing vested interest groups. Others would emphasize more the rational aspects of the process, the value of public debate and discussion, and the need for clearly defined ideals. In these differing views, conflict is inherent.

Another source of conflict would be the differing views about the feasibility of the strategy. Some might feel strongly that the strategy is highly complex, that the needed personnel could not be deployed, and that successful coordination would be improbable. Such views would counter those who would believe that, with appropriate support, the strategy could be implemented, that legislation could be affected, and that much could be gained from the experience that would be relevant to future planning.

Strategy IV: The Application of Operations Research to Local School District Problems

In some circles it is fashionable to maintain that local school districts and school boards are rapidly becoming passé. This view, it seems to me, needs to be questioned as sharply as planning for change needs to be defended. The view apparently is posited on very high expectations of the federal government's developing leadership role in education. However, since all of the federal government's programs to improve education must have their test ultimately at the local level, and since federal legislation has eradicated few, if any, of the basic educational problems in school districts, it would seem a wiser strategy, long-range, to seek to strengthen local school districts. More basically, in a period of great ferment, school districts need to be sufficiently strong to function with an integrity and a direction of their own.

Clearly, there are important constraints which interfere with the capacity of school districts to define their directions clearly and to project long-range plans for improvement. One of these is the increasing energy being invested by educational leaders in meeting external demands. Emerging local, state and national demands will continue to cause educational leaders to face outward; frequently, these programs will likely require leaders to engage, almost continuously, inthe management of conflict which will arise from external demands and opportunities, and from contrasting internal expectations and orientations. More basically, there will be the challenges of achieving sufficient flexibility to capitalize on the emerging opportunities to improve education, on the one hand, and of having sufficient vision and commitment to avoid chronic opportunism, on the other. The significance of planned change in the local school district, when viewed in relation to these challenges, would seem to be compellingly clear.

To meet the goal of planning, school districts must face the fact that, as a general rule, they now have neither the budget, nor the staff, nor the organization for long-range planning. Current approaches to planning in school districts seem much more informal and random than formalized and systematic. Thus, under existing arrangements, local districts find it difficult either to capitalize effectively on the federal programs now emerging or to assess these programs in relation to their own long-range priorities.

A major constraint standing in the way of attaining well staffed departments of planning are the negative attitudes held generally toward centralized units devoted to planning functions. Even within the context of local districts it is not easy to gain acceptance of centralized planning. At the same time the price of some cen-

tralization must be paid, if we are to achieve concerted deployment of specialized personnel. That such personnel are needed to develop solutions to complex planning problems would seem to be incontestable.

The conclusion that centralized planning in school districts will cause teachers and other personnel to have less freedom and less choice does not necessarily follow. Conceivably, central planning can develop and make explicit more alternatives for action; can present better organized and more relevant information; can afford personnel more time to pursue uniquely professional roles; and, in the final analysis, can help bring about a higher general quality of decision making. Much will depend upon the relationship of centralized planning to decentralized operations and upon the quality of linkage between these systems. Therefore, the problem of linkage is one of major significance for those concerned with strategy in school districts.

Linkage is dependent in part upon the quality and quantity of information available to central planners with regard to school and classroom operations. Traditionally, the inadequacy of information gathering and processing systems has been another major barrier to planning. With the advent of computers many schools and school districts are in a better position to rectify the situation at least partially. The future potential for information gathering is suggested in a statement made recently by Everett F. Lindquist in discussing the computer services now being developed by the Iowa Educational Information Center for the State of Iowa:[17]

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[17]Everett F. Lindquist, "Implications and Potential of Information Systems in Public Schools" in Computer Concepts and Educational Administration, Robert Marker, Peter McGraw and Franklin Stone, (eds.), Papers presented at the Twelfth UCEA Career Development Seminar, University of Iowa, April, 1965.

> A third major service will be to provide each school system and each school building annually with a descriptive analysis of its own student body, showing distributions of various measures, characteristics, interests, traits, and needs of the students in relation to similar distributions for the state as a whole. These school profiles, for example, will show how the students are distributed with reference to educational and vocational plans, goals, and aspirations; with reference to important characteristics of home and family, including educational and vocational status of parents; with reference to out-of-school activities of the student, including part-time employment; and with reference to the student's interests, likes and dislikes, evaluations of school experiences, and self-evaluation. Much of this information will be obtained each year from comprehensive questionnaires administered to all students. Many of these student body characteristics will be analyzed with reference to their interrelationships, and particularly, with reference to the measured educational achievement and aptitude of the student.

Professor Lindquist's forecast suggests not only the future importance of information processing in schools but also the need to have staff who can interpret data, can use it for designing alternative change strategies, and who can get the strategies assessed in relation to their potential implementation. More specifically, it underlines the need for developers and for systems of planning.

In acquiring staffs and developing organizations to advance planned change in education, school superintendents and others face an important strategic question: To what extent should they assume that universities, state education departments and related agencies will provide them staff help in achieving planned change, and to what extent should they build optimum planning capacities and needed staffing arrangements into their own organizations? Strategy IV deals in part with the staffing question as well as with constraints related to negative attitudes toward centralized planning and the limited systems for gathering and processing information.

More specifically, Strategy IV would involve the application by multi-disciplinary teams of selected operations research concepts and techniques to problems of planning in three or four school districts.[18] The major objective would be to get better answers to questions such as the following: Can organized multi-disciplinary teams, which are skilled in operations research, formulate questions about school planning problems which will help educational leaders see these problems in new ways? Can operations research teams contribute to planned change by helping design needed district-wide systems for gathering and processing information? Can operations research teams, with the cooperation of school district personnel, achieve more fruitful definitions of planning problems? Can operations research techniques help produce better solutions to educational or administrative problems? Are there special barriers in education which are not found in government and industry and which substantially limit the value of operations research concepts and techniques in school district planning?

Teams of operations researchers would be recruited from among those who have had significant experience in government and/or industry. They would work with school districts which already have strong planning departments and where there are personnel interested in exploring the uses of operations research in planning and in decision making.

Initially, the team of researchers might explore with school district personnel the problem(s) which might best be treated. Only a few problems would be

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[18]For a discussion of operations research see C. West Churchman, Russell L. Ackoff and E. Leonard Arnoff. Introduction to Operations Research, New York: John Wiley and Sons, Inc., 1957. For a succinct discussion of operations research as related to the interests of management see Russell L. Ackoff and Patrick Rivett, A Manager's Guide to Operations Research, New York: John Wiley and Sons, Inc., 1963.

selected in each of the three or four districts involved. Selection of problems would be achieved after extended consultation among school district personnel and the operations researchers. When the problem areas are chosen new personnel would then be added to the teams, if necessary. Thus, specialists in PERT (Program Evaluation and Review Techniques), for example, might be added to help solve sequencing problems in planning where specialists in mathematical programming might be needed if planning problems deal with resource allocation.

Operations research had its inception about 20 years ago in Great Britain when it was used to solve military problems related to the use of radar. Utilizing inter-disciplinary teams from the beginning, it was soon applied to industrial problems. By the early 1960's approximately one-third of the 500 largest corporations in the United States, for example, were using the method as an aid to planning and decision making.

The method has also had expanded use in governmental decision making. One of the more notable examples, in this latter regard, is the development and use of operations research and related techniques in the Department of Defense during Robert McNamara's tenure.[19]

Considerable literature on operations research has developed during the last 15 years from which concepts relevant to Strategy IV can be drawn. Ackoff and Rivitt, for example, have noted several characteristics of operations research which they believe are essential.[20] First, they have noted that operations researchers

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[19]See Daniel Seligman, "McNamara's Management Revolution," Fortune, July, 1965, pp. 177ff.

[20]Russell L. Ackoff and Patrick Rivett, Ibid., pp. 10-23.

have a special orientation to problem definition. Rather than cutting complex problems "down to size," operations researchers assume that the activity of any part of an organization may have an important impact upon other aspects of the system. Thus, problem definition becomes extremely important in operations research. In the process of problem definition, much attention is given to identifying significant interactions between and among various parts of the organization. Because of the scope of problems and the quantity of information involved, computers are often used in operations research.

Second, operations research must be carried out by a team of specialists. Within the context of schools, for example, problems could have economic dimensions, psychological dimensions, sociological dimensions and so forth. An important assumption is that in complex systems one cannot always predict which scientific viewpoint will prove most useful in defining problems and in designing solutions pertinent to them. A team of specialists is, therefore, a necessity.

Third, operations researchers start with the assumption that organizational systems cannot be controlled in their original environments and, therefore, scientific experimentation in the classical sense cannot be achieved. Their strategy for coping with this problem is to represent reality, typically, through mathematical models and to seek to understand it through different symbolic representations of reality. In a sense, they experiment with reality through the use of abstract symbols. In the process, an important part of the team's task is to determine those aspects of the environments which can and those which cannot be controlled.

While operations research, in theory, can be used on any system, it has had greatest use with management problems. While the content of problems are

many, the forms of almost all management problems can be classified in one of eight categories: allocation, routing, sequencing, competition, search, inventory, replacement and queuing. Mathematical techniques are available for coping with most of these problems, some of which are quite advanced.

In applying operations research conepts to education, several potential sources of conflict are apparent. For example, there would be those who would be highly critical of operations research because of its presumed, predominant orientation toward matters of efficiency. In a human enterprise such as education, many persons would resent such an orientation. They would argue strongly that efficiency is not the central consideration in planned educational change. On the other hand, others would maintain just as firmly that efficiency is a truly important value in education and that it is becoming more significant as increasing funds are invested in school systems; further, they might maintain that efficiency can be assessed only in relation to other important objectives in education. In these differing views there could be much conflict.

Second, operations research teams employ highly rational procedures. They seek to probe beneath the surface and to answer underlying questions. Thus, Daniel Seligman has described operations research techniques and systems analysis as these are used by McNamara in the Defense Department as follows:[21]

> "What is at bottom is an absolute insistence on being rational and systematic. In practice this means that the assumptions underlying positions must be made explicit, that issues must be defined rigorously, that possible courses of action must be examined in the light of their consequences, that data must be precise (i.e., quantified) whenever possible--"

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[21]Daniel Seligman, Ibid., p. 120.

To conclude: the four strategies presented in this paper represent rational dimensions of planned change. However, more than reason is necessary for successful planned change. As already implied, individual and societal attitudes toward change are crucial. Basic differences in attitudes are reflected in the titles of two contemporary books, Arthur Schlesinger's The Politics of Hope and Hadley Cantrel's The Politics of Despair. The heavy pessimism inherent in Norbert Wiener's The Human Use of Human Beings and the clear optimism which pervades John Gardner's Self-Renewal: The Individual and the Innovative Society are additional expressions of fundamentally differing attitudes toward change. Thus, we might conclude finally that faith will be at least as important as reason in meeting the future challenges of planned change in education.